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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,935	08/03/2006	Yoshichika Kawashima	2006_1266A	5426

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EXAMINER	
DESAI, NAISHADH N	

ART UNIT	PAPER NUMBER
2834	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/587,935	KAWASHIMA ET AL.	
	Examiner	Art Unit	
	NAISHADH N. DESAI	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 August 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *8/2/06* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/2/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 8/2/2006 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1,2,4-8,10-12,14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shannon et al (US 5485049) in view of Jaffe et al (US 3733506) and further in view of Tanaka et al (US 6127759).

3. Regarding claims 1, Shannon et al (US 5485049) teaches:

An electric motor characterized by comprising (abstract):

an armature core attached to a rotation shaft, having plural teeth radially extending in radial directions, and plural slots formed between teeth and extending along an axis direction (abstract and Fig 2);

a commutator provided on the rotation shaft to be adjacent to the armature core, with commutator members arranged in a circumferential direction (Figs 2 and 3),

a first brush which slides on the commutator (Fig 3);

a second brush which is provided apart from the first brush by a predetermined angle in a circumferential direction, and slides on the commutator (Fig 3);

a third brush which slides on the commutator and is used with either the first or second brush (Fig 3 and Col 1 ll 20-40);

Shannon et al do not literally teach:

the commutator members being equal in number to the slots,

an armature coil which is electrically connected between adjacent ones of the commutator members, having a first coil wound between given ones of the slots, and

a second coil, which is wound in an opposite direction to a direction of the first coil between slots existing at positions point-symmetric to the given ones of the slots with respect to a center of the rotation shaft, the armature coil being configured such that when the second brush contacts the adjacent ones of the commutator members to short-circuit the first and second coils through the second brush, the first and second

coils exist at symmetric positions with respect to an axis line extending through a center of the second brush and the center of the rotation shaft

Jaffe et al (Figs 2 and 3) teaches:

an armature coil which is electrically connected between adjacent ones of the commutator members, having a first coil wound between given ones of the slots (Figs 2 and 3), and

a second coil, which is wound in an opposite direction to a direction of the first coil between slots existing at positions point-symmetric to the given ones of the slots with respect to a center of the rotation shaft (Figs 2,3,6,8 and Col 4 ll 52-61, Col 5 ll 25-28),

the armature coil being configured such that when the second brush contacts the adjacent ones of the commutator members to short-circuit the first and second coils through the second brush (Col 2 ll 34-47),

the first and second coils exist at symmetric positions with respect to an axis line extending through a center of the second brush and the center of the rotation shaft (Col 2 ll 32-62 and Figs 2-4,6 and 8).

Jaffe et al do not teach the commutator members being equal in number to the slots

Tanaka et al (Fig 1) teaches a device having commutator members being equal in number to the slots

Shannon et al teaches a multi speed motor. Shannon et al do not literally teach the motor to be wound in a specific manner or that the commutator members are equal in number to the slots. Jaffe et al teaches a motor having a winding pattern wherein the

second coil is wound in the opposite direction of the first coil. Jaffe et al do not leterally teach that the commutator members are equal in number to the slots. Tanaka teaches a motor wherein the commutator members are equal in number to the slots. It would have been obvious to a person having ordinary skills in the art at the time the invention was made to modify the device of Shannon et al with the teachings of Jaffe et al and Tanaka et al to make a motor having commutator members being equal in number to the slots and a winding pattern wherein the second coil is wound in the opposite direction of the first coil. The motivation to do so would be that if would provide for a more efficient motor, reduce sparking and EMI (electro magnetic interference), increase brush and commutator life (abstract of Jaffe et al). The motivation would also be that it would allow one to reduce torque ripple, noise, friction, torque loss and allow for a simpler construction of the motor (Col 3 ll 36-43 of Tanaka et al).

4. Regarding claim 2, Jaffe et al (Fig 8 and Col 5 ll 25-28) teaches that the first and second coils are connected in series with each other.

5. Regarding claim 4, Jaffe et al (Figs 2-4,6 and 8) teaches that each of the first and second coils has a main coil wound between two of the slots, and a subsidiary coil wound only along any one of the slots between which the main coil is wound.

6. Regarding claim 5, Jaffe et al (Figs 2-4,6 and 8 and Col 5 ll 10-11) teaches that each of the main coils of the first and second coils is wound by an equal number of

turns around the armature core, and each of the subsidiary coils is wound on the armature core by 0.5 turns around the armature core.

7. Regarding claim 6, Jaffe et al (Figs 2-4,6 and 8) teaches that the subsidiary coils are formed between the main coils of the first and second coils.

8. Regarding claim 10, Jaffe et al (Figs 2-4,6 and 8) teaches that each of the first and second coils has a main coil wound between two of the slots, and a subsidiary coil wound only along any one of the slots between which the main coil is wound.

9. Regarding claim 11, Jaffe et al (Figs 2-4,6 and 8) teaches that the subsidiary coils are formed between the main coils of the first and second coils.

10. Regarding claims 8,12,14-17, Jaffe et al (Col 5 l 15) teaches that the slots are an even number of slots not less than eight.

Regarding claim 7, Shannon et al teaches:

An electric motor characterized by comprising (abstract):

an armature core attached to a rotation shaft, having plural teeth radially extending in radial directions, and plural slots formed between teeth and extending along an axis direction (abstract and Fig 2);

a commutator provided on the rotation shaft to be adjacent to the armature core, with commutator members arranged in a circumferential direction (Figs 2 and 3),

a first brush which slides on the commutator (Fig 3);

a second brush which is provided apart from the first brush by a predetermined angle in a circumferential direction, and slides on the commutator (Fig 3);

a third brush which slides on the commutator and is used with either the first or second brush (Fig 3 and Col 1 ll 20-40);

Shannon et al do not literally teach:

the commutator members being equal in number to the slots;

an armature coil which is electrically connected between adjacent ones of the commutator members, having a first coil wound between given ones of the slots, and

a second coil, which is wound in an opposite direction to a direction of the first coil between the same slots as the given ones of the slots, the armature coil being configured such that when the second brush contacts the adjacent ones of the commutator members to short-circuit the first and second coils through the second brush, the first and second coils exist on an axis line extending through a center of the second brush and the center of the rotation shaft.

Jaffe et al (Figs 2 and 3) teaches:

an armature coil which is electrically connected between adjacent ones of the commutator members, having a first coil wound between given ones of the slots (Figs 2 and 3), and

a second coil, which is wound in an opposite direction to a direction of the first coil between the same slots as the given ones of the slots (Figs 2,3,6,8 and Col 4 ll 52-61, Col 5 ll 25-28),

the armature coil being configured such that when the second brush contacts the adjacent ones of the commutator members to short-circuit the first and second coils through the second brush (Col 2 ll 34-47),

the first and second coils exist on an axis line extending through a center of the second brush and the center of the rotation shaft (Col 2 ll 32-62 and Figs 2-4,6 and 8). Jaffe et al do not teach the commutator members being equal in number to the slots Tanaka et al (Fig 1) teaches a device having commutator members being equal in number to the slots

Shannon et al teaches a multi speed motor. Shannon et al do not literally teach the motor to be wound in a specific manner or that the commutator members are equal in number to the slots. Jaffe et al teaches a motor having a winding pattern wherein the second coil is wound in the opposite direction of the first coil. Jaffe et al do not literally teach that the commutator members are equal in number to the slots. Tanaka teaches a motor wherein the commutator members are equal in number to the slots. It would have been obvious to a person having ordinary skills in the art at the time the invention was made to modify the device of Shannon et al with the teachings of Jaffe et al and Tanaka et al to make a motor having commutator members being equal in number to the slots and a winding pattern wherein the second coil is wound in the opposite direction of the first coil. The motivation to do so would be that if would provide for a

more efficient motor, reduce sparking and EMI (electro magnetic interference), increase brush and commutator life (abstract of Jaffe et al). The motivation would also be that it would allow one to reduce torque ripple, noise, friction, torque loss and allow for a simpler construction of the motor (Col 3 ll 36-43 of Tanaka et al).

Claims 3, 9 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shannon et al (US 5485049) in view of Jaffe et al (US 3733506), in view of Tanaka et al (US 6127759) and further in view of Baines (GB 2209439)

11. Regarding claim 3, Baines (abstract) teaches that the first and second coils are connected in parallel with each other.

Shannon et al teaches a multi speed motor. Shannon et al do not literally teach the motor to be wound in a specific manner or that the commutator members are equal in number to the slots. Jaffe et al teaches a motor having a winding pattern wherein the second coil is wound in the opposite direction of the first coil. Jaffe et al do not literally teach that the commutator members are equal in number to the slots. Tanaka teaches a motor wherein the commutator members are equal in number to the slots. Tanaka does not mention that the coils are connected in parallel. Baines teaches that the coils of a motor can be connected either in series or parallel (abstract). It would have been obvious to a person having ordinary skills in the art at the time the invention was made to modify the device of Shannon et al with the teachings of Jaffe et al and Tanaka et al to make a motor wherein the number of commutator members are equal to the number of slots, a winding pattern wherein the second coil is wound in the opposite direction of

the first coil and to connect the coils in parallel as taught by Baines. The motivation to do so would be that if would provide for a more efficient motor, reduce sparking and EMI (electro magnetic interference), increase brush and commutator life (abstract of Jaffe et al). The motivation would also be that it would allow one to reduce torque ripple, noise, friction, torque loss and allow for a simpler construction of the motor (Col 3 ll 36-43 of Tanaka et al). The motivation would further be that it would simplify manufacturing of the motor.

12. Regarding claim 9, Baines (abstract) teaches that the first and second coils are connected in parallel with each other.

13. Regarding claim 13, Jaffe et al (Col 5 l 15) teaches that the slots are an even number of slots not less than eight.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO-892 for details.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NAISHADH N. DESAI whose telephone number is (571)270-3038. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on (571) 272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Darren Schuberg/
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